

REMARKS

Rejections under 35 USC 102

The Examiner rejected claims 1 through 4, 16 and 18 through 20 as being anticipated by Published Application US 2002/0152954 to Takamori et al. (hereinafter the '954 publication). The Examiner rejected claims 1 through 10 and 12 through 20 as being anticipated by Published Application US 2002/0176936 to Matsuyama (hereinafter the '936 publication). The Examiner additionally rejected claims 1 through 7, 10, 12 through 18 and 20 as being anticipated by US Patent 5,919,520 to Tateyama et al. (hereinafter the '520 patent).

The independent claims 1, 5, 14 and 16 have been amended to recite that the control fluid is substantially solvent-free, while amended independent claim 20 now states that the airflow is substantially solvent-free. MPEP 2173.05(i) indicates that negative limitations are permissible if there is basis for such limitation in the original disclosure. Page 11, lines 17 through 20, taken in conjunction with lines 10 and 11, as well as page 13, lines 4 through 9 provide such basis, manifesting a clear intent by the Applicant to use the control fluid as a way to produce a local reduction in the solvent that is initially present in the deposited resist layer. As such, it is unreasonable to hold that the very control fluid being used to remove solvent is itself going to contain the same, especially in light of the remainder of the specification that makes removal of the solvent contained within or used in conjunction with the resist layer an important part of achieving the desirable thickness uniformity of the layer of resist that has been deposited onto a substrate. In the present application, the Applicant clearly indicates that nitrogen, argon (or some related inert gas) or air serve as the control fluid. By logical extension, such a control fluid is free of the types of solvents commonly used in semiconductor wafer resist layers. Considering the totality of the original disclosure, it is clear that the gas used as the control fluid must be solvent-free. As such, reciting that the control fluid is solvent-free is both permissible and sufficient to avoid the teaching of any and all of the cited references.

In addition to now reciting that the imparted gaseous control fluid is solvent-free, the amended independent claims now recite that the resist being deposited by the device contains a solvent. There is nothing in the '954 disclosure to teach or suggest a resist-depositing device where a control fluid supply imparts a solvent-free control fluid onto a deposited solvent-containing resist layer in order to effect a local change in the resist layer's evaporation rate. Specifically, FIGS. 5 through 8, as well as 15 show first a deposition of a solvent layer (from solvent pipe **62**), followed by deposition of a resist layer (from resist pipe **61**) which is then followed by deposition of a high pressure gas flow that (as described in numbered paragraph [0127] spreads the resist around by the force made by this high pressure. Even more particularly, the '954 application indicates that the gas that passes through gas pipe **63** includes "evaporated solvent", placing it clearly at odds with the amended independent claims.

Likewise, there is nothing in the '936 publication to teach or suggest the deposition of a solvent-free gaseous control fluid onto a deposited solvent-containing layer to effect local changes in evaporation of the deposited layer. In fact, the '936 teaches just the opposite way of depositing a control fluid, stating unequivocally in paragraph [0046] that the control fluid supplies a gas "inclusive of a solvent mist" and that such a mist is different from the solution used as the resist. Furthermore, sprayer **76** (which is shown in FIG. 4 and discussed in paragraph [0048]) is used to introduce the control fluid's solvent. Further, paragraph [0066] indicates that while the resist originally includes resist, the control fluid also does, thereby giving the '936 publication at least one significant difference over the amended claims.

The '520 patent teaches depositing a resist **BL** after deposition of a solvent **AL** as shown in FIG. 2. The '520 patent clearly contemplates that the resist include a solvent, as discussed at column 4, lines 28 through 30. In addition, the solvent **AL** used as a control fluid "consists essentially of the solvent" of the resist, as noted at column 4, lines 36 through 37. Moreover, column 6, lines 31 through 32 indicate that the solvent **AL** is used to increase wettability of the wafer **W** to be coated, where it is understood by those skilled in the art that such wettability is achieved through a liquid (rather than the claimed gaseous) control fluid. The Examiner additionally confounds the teaching of the '520 patent relative to the language of the independent

claims that recites that the control fluid supply imparts a gaseous control fluid onto the deposited resist. As shown in FIG. 2 of the '520 patent and described at column 4, lines 38 through 46, there is no gaseous control, merely a liquid solvent that by operation of a pressurized nitrogen gas is fed to the wafer substrate. There is nothing in the '520 patent to even remotely suggest that the nitrogen makes up the control fluid. Assuming arguendo that it did, the solvent contained therein is now expressly excluded as being a part of the control fluid of the independent claims. For both of these reasons, the Applicants submit that the '520 patent can no longer serve as a valid anticipatory reference.

Because a valid anticipatory rejection under MPEP 2131 requires that every claim limitation must be taught or suggested, and neither the '954 publication, the '936 publication nor '520 patent satisfies such requirement for the reasons discussed above, the Applicant respectfully submits that the present amended claims requires that Examiner's anticipatory rejection be withdrawn.

Rejections under 35 USC 103

The Examiner rejected claims 8 and 9 as being obvious over the '520 patent in view of the '936 publication. The Examiner rejected claim 11 as being obvious over the '936 publication in view of US Patent 7,077,910 (hereinafter the '910 patent). By virtue of the present amendment to independent claim 5 from which claims 8, 9 and 11 depend, as well as the remarks made above in conjunction with the anticipatory rejections, the Applicant respectfully submits that the present obviousness rejections must also be withdrawn.

As discussed in MPEP 2143.03, one of the requirements to establish a *prima facie* case of obviousness under MPEP 2143 is that all of the claim limitations must be taught or suggested. As stated above with regard to the anticipatory rejection, there is nothing in either of the '520 patent or the '936 publication to teach or suggest a substantially solvent-free gaseous control fluid being supplied to a layer of deposited solvent-containing resist coating in order to control a localized rate of evaporation of the resist. Likewise, there is nothing in the '910 patent to teach or

suggest a combination of such features. At most, the '910 patent employs a gas to purge a coating chamber or to provide humidity or temperature control within the entire chamber. Moreover, the introduction of the gas is global (i.e., within the substantial entirety of the coating chamber) rather than to a discrete location on the item being coated. Because none of the cited references teach or suggest all of the limitations of the amended independent claims, the Examiner may no longer rely upon them to satisfy a *prima facie* case of obviousness for dependent claims 8, 9 and 11.

For all of the above reasons, the Applicant respectfully submits that the present rejection has been overcome, and that a finding of allowability by the Examiner as to all of the present claims be issued forthright. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,

DINSMORE & SHOHL L.L.P.

By: /John D. Reed/
John D. Reed
Registration No. 46,506

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405
e-mail: john.reed@dinslaw.com

JDR/